# Exhibit 1

Xcel Energy Site Permit Amendment Application – Part 1 of 4

August 20, 2019

PUC Document ID: **20198-155331-01**

MPUC Docket IP-6946/WS-17-410

(filed "ON BEHALF OF XCEL ENERGY")

414 Nicollet Mall
Minneapolis, MN 55401

August 20, 2019

**—Via Electronic Filing—**

Daniel P. Wolf
Executive Secretary
Minnesota Public Utilities Commission
121 7th Place East, Suite 350
St. Paul, MN 55101

RE: SITE PERMIT AMENDMENT APPLICATION
FREEBORN WIND PROJECT
DOCKET NO. IP-6946/WS-17-410

Dear Mr. Wolf:

Northern States Power Company, doing business as Xcel Energy (the Company), requests that the Minnesota Public Utilities Commission (the Commission or MPUC) approve an amendment to the existing Freeborn Wind Farm Large Wind Energy Conversion System (LWECS) site permit originally issued to Freeborn Wind Energy LLC (Freeborn Wind) on December 19, 2018, as amended by the Commission on May 10, 2019 (Site Permit). The Company makes this request pursuant to Minn. R. 7854.1300, subp. 2 and Site Permit Section 13.0.

On December 19, 2018, the Commission issued a Site Permit for construction and operation of the up to 84 MW wind farm. On May 10, 2019, the Commission issued an Order Amending Site Permit. On June 18, 2019, the Company and Freeborn Wind jointly submitted a Notice of Acquisition of Freeborn Wind, Request to Transfer the LWECS Site Permit issued for the 84 MW Freeborn Wind Project in Freeborn County (see MPUC Docket No. IP-6946/WS-17-410, Document ID 20196-153672-02). With that filing, the Company and Freeborn Wind provided notice to the Commission that on June 14, 2019, the companies closed on the sale of Freeborn Wind to the Company, and as such, the Company has assumed ownership of Freeborn Wind development assets, including the Freeborn Wind Farm.

Freeborn Wind Farm is part of the Company's 1,550 MW wind generation portfolio that was approved by the Commission in September 2017 (see MPUC Docket No. E002/M-16-777, Document ID 20179-135205-01) and is one of the four projects the Company intends to build, own and operate.

We are requesting this further permit amendment for several reasons. First, we are requesting an updated turbine layout that incorporates Vestas V110 and V120 turbine generator models (the 2017 Application included the Vestas V110 and V116 turbine models, and for reasons explained below, the Vestas V116 is no longer being used for the Project). Specifically, the Application included 10 Vestas V110 turbines and 32 Vestas V116 turbines; the 2019 Project layout includes 10 Vestas V110 turbines and 31 Vestas V120 turbines (2019 Project Layout).[1] The turbine model change is one of the measures taken by the Company to mitigate the economic impacts of the 2017 Tax Cuts and Jobs Act (TCJA).[2] With a larger rotor diameter and wind-swept area, V120 turbines have higher annual energy production than either the V116 or V110 turbines. The combination of V110 and V120 turbine generators, therefore, is expected to achieve a greater capacity factor than the originally permitted layout of Vestas V110 and V116 models. This higher capacity factor will result in higher annual energy production, which in turn will reduce the levelized cost of energy and mitigate the impacts of the TCJA.

Second, we are requesting an updated turbine layout. The changes we are requesting to the previously permitted layout are relatively small and based on a variety of factors, including advanced engineering since the Site Permit was granted, geotechnical data relative to individual turbine sites, landowner input, and environmental information gathered in the field that influenced micro-siting of turbines, and any setbacks required as a result of turbine selection and of these turbine shifts. As is shown in the updated environmental analysis below, the 2019 Project Layout and turbines helps minimize the impacts to human health and the environment and are similar to, or less than, the anticipated impact from the originally permitted layout.

The Company is submitting this proposed Site Permit Amendment after consulting with Minnesota Department of Commerce Energy Environmental Review and Analysis (EERA) staff. Below, we provide a brief background, update the Environmental Information from the June 2017 Site Permit Application based on the 2019 Project Layout, then address various sections of the site permit, requesting amendments where necessary.

## A. BACKGROUND

The Freeborn Wind Farm LWECS wind project was developed by Freeborn Wind, originally an affiliate of Invenergy LLC (Invenergy) in southeastern Freeborn County, Minnesota. In June 2017, Freeborn Wind submitted a Site Permit Application (Application) to the Commission for the Freeborn Wind Farm (Project). The Project Area

[1] One turbine location (T-47) was removed from the 2019 Project Layout to comply with noise setbacks.

[2] In a Supplement filed by the Company on May 11, 2018, in Docket No. E002/M-16-777, the Company stated that it planned to use a combination of V110, V116 and V120 turbines for the Freeborn Wind Farm. Since that time, however, the Company has decided to install V120 turbines instead of the V116 turbines. This decision is based on updated modeling conducted related to the V116 turbines that showed a lower savings in the levelized cost of energy when compared to the V120. As noted in the Supplement, the V120 turbines also are being installed for the other projects in the 1,550 MW Portfolio.

included in the Application was approximately 26,273 acres, and it has not changed since then. While additional participating land has been added to the overall existing Project Area, the wind turbine facilities in the Project continue to be sited within the original June 2017 Project Area (Attachment A). As of the date of this filing, Freeborn Wind has secured 21,313 acres in Minnesota, which is sufficient to construct and operate the Project. Attachment B includes a comparison of the Vestas V110/V116 layout included in the Application to the 2019 Project Layout, and Attachment C demonstrates compliance of the 2019 Project Layout with setbacks included in the Site Permit.

As indicated above, we propose to replace the Vestas V116 turbines with Vestas V120 turbines for the 2019 Project Layout. The Vestas V120 turbine has a slightly larger rotor diameter (RD) and total height compared to the Vestas V116, and as a result also has a slightly larger setback distance. The following tables (updated from the Application) provide updated Project turbine information for the 2019 Project Layout.

**Updated Table 5.1-2: Representative Minimum Turbine Setback Distances by Turbine Model**

| Turbine Description[1] | RD (m/ft) | 5 RD (m/ft) | 3 RD (m/ft) | Total Height, Including Blades (m/ft) |
|---|---|---|---|---|
| Vestas V110 | 110 / 361 | 550 / 1,805 | 330 / 1,083 | 135 / 443 |
| Vestas V120 | 120 / 394 | 600 / 1,969 | 360 / 1,182 | 140 / 460 |

[1] Tower heights will be 80 m (263 ft).

**Updated Table 5.2-1: Wind Turbine Characteristics**

| Characteristic | Turbine Model | |
|---|---|---|
| | Vestas V110 | Vestas V120 |
| Nameplate capacity (kW) | 2000 | 2000[3] |
| Hub height (m) | 80 (262.5 ft) | 80 (262.5 ft) |
| Rotor Diameter (m) | 110 (360.0 ft) | 120 (393.7 ft) |
| Total height (m)[1] | 135 (442.9 ft) | 140 (459 ft) |
| Cut-in wind speed (m/s)[2] | 3 (6.7 mph) | 3 (6.7 mph) |
| Cut-out wind speed (m/s)[4] | 20 (44.7 mph) | 20 (44.7 mph) |
| Wind Swept Area ($m^2$) | 9,503 (102,289 $ft^2$) | 11,310 (121,740 $ft^2$) |

[1] Total height = the total turbine height from the ground to the tip of the blade in an upright position.
[2] Cut-in wind speed = wind speed at which turbine begins to operate.
[3] Vestas V120 turbines have a base capacity of 2.0 MW but include software that allows operation at 2.2 MW. The Company intends to operate each turbine only up to its base capacity of 2.0 MW.
[4] Cut-out wind speed = wind speed above which turbine shuts down operation.

Based on the 2019 Project Layout, Xcel Energy is updating the environmental impact analysis originally submitted in the Application. Each updated section of the environmental information is provided below. Some sections, such as demographics, did not change based on the updated 2019 Project Layout. Other sections have more detailed analysis. Additionally, all maps included in the Application have been updated to reflect the 2019 Project Layout (Attachment D – 18 maps).

## B. SUPPLEMENTAL ENVIRONMENTAL INFORMATION

### 8.1 Demographics

The 2019 Project Layout does not change the description of resources, impacts, or mitigative measures in the demographics section. The Application describes these subsections accurately.

### 8.2 Land Use

The 2019 Project Layout does not change the description of resources, impacts, or mitigative measures for land use. Similar to the layout in the Application, all turbines in the 2019 Project Layout are generally sited in Freeborn County's Agricultural District. Wind energy projects are generally consistent with the uses such zoning districts allow.

### 8.3 Noise

Hankard Environmental, Inc. (Hankard), acoustical consultants for the Project, updated the Noise Assessment for the 2019 Project Layout (Attachment E) which uses a combination of Vestas V110 and V120 turbines, some of which were modeled as being equipped with Serrated Trailing Edge (STE) technology.[3] The overall sound power level at the turbine hub is 110.6 dBA for the V120 model, and 107.6 dBA for the V110. For turbines with STE blades, the overall sound power level at the turbine hub is 108.6 dBA for the V120, and 106.0 dBA for the V110. Results of the updated Noise Assessment for the 2019 Project Layout are included in the Updated Figure 6a (indicating noise level contours for 40, 45 and 50 dBA), as well the 47 dBA noise level contour, indicated in New Figure 6b (both included in Attachment D). The updated Noise Assessment is included as part of this Application as Attachment E, and shows that the new modeled outputs are relatively the same.

The maximum calculated turbine-only noise level at a residence, based on assumptions incorporated into the *SoundPLAN* software program's implementation of the ISO 9613-2 calculation method and the 2019 Project Layout, is 45 dBA ($L_{50}$) (maximum Project-related $L_{50}$; see New Tables 8.3-5 and 8.3-6 below). Additionally, the maximum noise level produced at the Project ("loudest hour") at any of the 253 receptor locations, when accounting for both turbine and background noise, modeled less than 47 dBA. These values comply with Site Permit Section 6.1.

[3] Hankard modeled all of the Project turbines in MN and the northernmost 47 turbines in IA, which included 6 standard V110 turbines, 4 STE V110 turbines, 57 standard V120 turbines and 21 STE V120 turbines.

**New Table 8.3-5: Summary of Total Noise Assessment 2019 Project Layout**

| Residence Classification | Total Noise (Background of 35 dBA[1] + Maximum Turbine-Only Noise Level) | | |
|---|---|---|---|
| | Avg $L_{50}$ Modeled | Max $L_{50}$ Modeled | Min $L_{50}$ Modeled |
| dBA at All Residences | 39.3 | 45.4 | 35.6 |
| dBA at Participating Residences | 40.8 | 45.4 | 36.6 |
| dBA at Non-Participating Residences | 38.8 | 45.4 | 35.6 |
| [1] The average Project nighttime sound level was 35 dBA ($L_{50}$); see Table 4-2 in the June 5, 2017 Pre-Construction Noise Analysis report Appendix B in the Application. | | | |

**New Table 8.3-6: Summary of Turbine Only Noise Assessment 2019 Project Layout**

| Residence Classification | Turbine Only Noise | | |
|---|---|---|---|
| | Avg $L_{50}$ Modeled | Max $L_{50}$ Modeled | Min $L_{50}$ Modeled |
| dBA at All Residences | 36.3 | 45.0 | 26.6 |
| dBA at Participating Residences | 38.6 | 45.0 | 31.3 |
| dBA at Non-Participating Residences | 35.4 | 45.0 | 26.6 |

The model shows the maximum turbine-only noise level (all turbines at full power) that the Project will produce at any receptor location is 45 dBA. The average turbine-only noise level is predicted to be approximately 36 dBA. With respect to total noise – adding background noise to project noise – the model shows the maximum noise level at any receptor to be 45.4 dBA.

Hankard conducted sound monitoring at five locations to assess background sound levels in 2017. The average nighttime sound ($L_{50}$) at the five on-site monitors was 35 dBA (see Attachment E). Taking into account this average background nighttime $L_{50}$ of 35 dBA, the average total sound levels (background sound level plus turbine-only noise level) is 38 dBA at non-participating residences and 40 dBA at participating residences (New Table 8.3-5 and Attachment E). The maximum total noise level is 45.4 dBA at any residence.

The description of resources and mitigative measures subsections from the Application accurately reflects the 2019 Project Layout, except that Receptor R-189 is no longer present (since 2017, it has been abandoned and burned down, and is therefore no longer a receptor present). As indicated above, select turbines at Freeborn Wind Farm will have STE blade technology to help minimize noise impacts.

## 8.4 Visual Impacts

The 2019 Project Layout does not appreciably change the description of resources, visual impacts on public resources, visual impacts on private lands and homes. The V120 turbines, which replace the V116 turbines in the Application, have a larger RD (the V116 has a 116 m RD and the V120 has a 120 m RD), so visual impacts would be slightly greater than those represented by the Vestas V116 layout in the Application. In the Application, there were 32 V116 turbines and in the 2019 layout there are 31 V120 turbines overall for the Project. There were preliminarily 32 V116 and 10 V110 turbines in Minnesota in the Application. As indicated above, for the 2019 Project Layout, the V116 turbines will be replaced by 31 V120 turbines. Mitigative measures for these changes would also be similar to those described in the Application.

EAPC Wind Energy, Inc. (EAPC) updated the Shadow Flicker Assessment for the 2019 Project Layout (Attachment F). The Application identified seven occupied residences where shadow flicker would register more than 30 hours per year. The conservative results of the 2019 Shadow Flicker Study, based on the 2019 Project Layout, indicate that for the 253 receptors modeled, there are now only six occupied residences registering more than 30 hours per year, ranging from 30 hours to 42 hours and 31 minutes. The residence that no longer exceeds the 30 hour threshold is a project non-participant. Of the six occupied residences projected to exceed 30 hours of shadow flicker per year, three are project participants and three are non-participants. (See Updated Tables 8.4-2 and 8.4-3 for V120 wind turbine model, Updated Figure 8 in Attachment D, and Table 3 in Attachment F.) This conservative analysis did not take credit for the blocking of trees and buildings and did not model specific facades of buildings.

**Updated Table 8.4-2: Maximum Predicted Shadow Flicker Impacts for Participating Residents**

| Shadow Flicker Statistics | V120 (hours:minutes/year) |
|---|---|
| Maximum Shadow Flicker – Conservative Case | 106:52 |
| Average Shadow Flicker – Conservative Case | 18:39 |
| Maximum Shadow Flicker – Realistic Case | 42:31 |
| Average Shadow Flicker – Realistic Case | 6:31 |

**Updated Table 8.4-3: Maximum Predicted Shadow Flicker Impacts for Non-Participating Residents**

| Shadow Flicker Statistics | V120 (hours:minutes/year) |
|---|---|
| Maximum Shadow Flicker – Conservative Case | 123:36 |
| Average Shadow Flicker – Conservative Case | 8:44 |
| Maximum Shadow Flicker – Realistic Case | 41:57 |
| Average Shadow Flicker – Realistic Case | 2:54 |

The mitigative measures for shadow flicker described in the Application would apply to potential impacts for the 2019 Project Layout. Additionally, the Company will comply with the shadow flicker mitigation conditions contained in Site Permit Section 7.4.

### 8.5 Public Services and Infrastructure

The 2019 Project Layout does not change the description of resources, impacts, or mitigative measures for public services and infrastructure, telecommunications, communication systems, television, or other infrastructure. Impacts and mitigative measures for roads do not differ from the Application.

### 8.6 Cultural and Archaeological Resources

Freeborn Wind completed Phase I archaeological reconnaissance surveys of the Project in July 2018 and May 2018, as well as an assessment of the potential visual impact of the Project on the Lodge Zare Zapadu No. 44 (a.k.a. Bohemian Brick Hall), a listed National Register of Historic Places (NRHP) site located within the Project Area in August 2018. Results of these surveys were submitted to the Minnesota State Historic Preservation Office (SHPO) for review.

The visual impact assessment of the Lodge Zare Zapadu evaluated the effects of the Project on this site, which was determined to have no adverse effect. The SHPO concurred with this determination (see Attachment H). A follow-up to the 2018 Phase I cultural resource field survey was conducted for an additional 123 acres that fell outside of the original survey of the Project, and identified no new sites. Upon review of this information, the SHPO stated that its earlier determination that there are no properties listed in the National or State Registers of Historic Places, and no known or suspected significant archaeological properties in the area that will be affected by this Project, remains valid with the proposed Project changes (see Attachment I).

In June 2019, cultural resource specialist staff at In Situ Archaeological Consulting, LLC, conducted an updated literature review of the Project Area and a 1-mile buffer. During the literature review, five new archaeological sites were recorded within the Project Area (21FE0084, 21FE0085, 21FE0086, 21FE0087, and 21FE0088), whereas none were identified as part of the Application. These five new archaeological sites were identified as part of the cultural resource field survey conducted for the Project (see above).[4] Of these sites, 21FE0084 is a Pre-Contact lithic scatter site, 21FE0085 is a Post-Contact farmstead site, and 21FE0086, 21FE0087, and 21FE0088 are all Pre-Contact lithic isolated find sites. None of the five newly recorded sites is eligible for the NRHP and no additional evaluation efforts will be required.

There is one fewer previously reported architectural resource site (this site, FE-OAK-001, falls outside of the 1-mile study area by approximately 0.5 miles) and two new architectural sites (FE-GLE-002 [unevaluated] and FE-GLE-003 [eligible]) within the 1-mile study area. (see Updated Table 8.6-1). Because site FE-OAK-001 is located outside the 1-mile study

[4] The results of this survey were compiled into a report entitled "*Due Diligence Archaeological Survey, Freeborn Wind Farm, Freeborn County, Minnesota*" (December 2018), which was submitted to the SHPO for review.

area, it is deleted in Updated Table 8.6-1. The two new architectural sites were both recorded in 1984 and are located just within (30 and 140 feet) the 1-mile study area. These sites have been added to Updated Table 8.6-1 below.

**Updated Table 8.6-1: Previously Reported Architecture Resources within the 1-Mile Study Area**

| County | Architecture Inventory Number | Property Name | Address | Property Category | Property Type | NRHP Eligibility | Within Project Area (Y/N) |
|---|---|---|---|---|---|---|---|
| Freeborn | FE-GLE-002 | Commercial Building | SW corner Main St. W. & 2nd Ave. SW | Commerce | Commercial Building | Unevaluated | N |
| Freeborn | FE-GLE-003 | Shell Rock District School No. 49 | SE corner Main St. & 2nd Ave. SW | Education | School | Eligible | N |
| ~~Freeborn~~ | ~~FE-OAK-001~~ | ~~Trondhjem Norwegian Evangelical Lutheran Church~~ | ~~Off County Road 11~~ | ~~Religion~~ | ~~Church~~ | ~~Unevaluated~~ | ~~N~~ |

The impacts and mitigative measures described in the Application remain true based upon the results of the previously conducted cultural resources field investigation. As indicated above, the Company has conducted a Phase 1a archaeological resources inventory for the final layout, has assessed the potential visual impact of the Project on a NRHP site, and has coordinated with SHPO and the Office of State Archaeologist (OSA). The SHPO concurred with the findings of these studies and no further work is required by the SHPO. The Company will follow up with SHPO regarding the two new architectural sites identified in the June 2019 literature review.

## 8.7 Recreation

The recreation lands described in the Application are generally the same for the 2019 Project Layout. The following are updates to these lands since the Application (see Updated Figure 5 in Attachment D):

- One parcel of the Goose Lake Waterfowl Production Area (WPA) was renamed to Bhagyam WPA in the most recent USFWS public data. No new parcels have been added to this WPA and the WPA area remains the same; and,

- The snowmobile trail locations have been updated since the Application.

The impacts and mitigative measures described in the Application are consistent with the 2019 Project Layout. Turbines are sited at least 3 RD by 5 RD away from Wildlife Management Areas (WMAs) and WPAs and no other Project facilities are sited on these lands. The closest turbine to the snowmobile trails is T-24 at approximately 503 feet (Figure 2).

## 8.8 Public Health and Safety

One new airport within 20 miles of the Project Area was identified since the Application was prepared. An updated Table 8.8-1 below includes information regarding this new airport.

**Updated Table 8.8-1: Airports within 20 Miles of the Project Site**

| Airport Name | City | County, State | Distance[1] | Runway Information[2] | Runway Elevation (feet)[3] |
|---|---|---|---|---|---|
| Radloff's Cedar View Farms | Austin | Mower, MN | 1.6 miles E of Project | Turf | 1,240 ft |

[1] Distance in miles from the nearest portion of the Freeborn Wind Farm Project Area.
[2] Runway surface type and condition.
[3] Elevation in feet at the highest point on the centerline of the useable landing surface. Measured to the nearest foot with respect to mean sea level.

Including the additional airport identified above, the 2019 Project Layout does not change the description of resources, impacts, or mitigative measures for public health and safety. Xcel Energy will file the final turbine locations for approval as necessary with the Federal Aviation Administration.

## 8.9 Hazardous Materials

The 2019 Project Layout does not change the description of resources, impacts, or mitigative measures for hazardous materials. Xcel Energy has conducted a Phase 1 Environmental Site Assessment at the Project.

## 8.10 Land-based Economies

The Project Area has not changed since the Application, and the majority of the Project Area remains in agricultural use (see Updated Figure 11 in Attachment D). While similar to the Application, the following is a summary of updated National Land Cover Database (NLCD) currently applicable to the Project Area. Cultivated crops comprise approximately 24,700 acres (94.01 percent) of the Project Area. Developed open space lands comprise approximately 814 acres (3.1 percent) and deciduous forest lands comprise approximately 184 acres (0.70 percent) of the Project Area. Approximately 8,445 acres (32.15 percent) of the soil within the Project Area is classified as prime farmland.

The 2019 Project Layout will permanently impact approximately 30.3 acres of agricultural land (cultivated crops), which is 3.0 acres less than the 33.3 acres of permanent loss agricultural land in the Application. The 2019 Project Layout will impact approximately 7.9 acres of prime farmland, most of which is for access roads (see New Table 8.10-1 for summary), which is 0.6 acres less impact than as described in the Application. The mitigative measures described in the Application also apply to the 2019 Project Layout.

**New Table 8.10-1: Summary of Prime Farmland Impacts (2019 Project Layout)**

| | All Areas Prime Farmland | | Prime Farmland if Drained | | Farmland of Statewide Importance | | Not Prime Farmland | | Total Acres Impacted |
|---|---|---|---|---|---|---|---|---|---|
| | # Turbines | Acres | # Turbines | Acres | # Turbines | Acres | # Turbines | Acres | |
| Turbines | 12 | 0.7 | 28 | 1.6 | 2 | 0.1 | 0 | 0.0 | **2.4** |
| Access Roads | 0 | 7.0 | 0 | 17.7 | 0 | 0.3 | 0 | 0.0 | **25.0** |
| Project Substation and O&M | 0 | 0.2 | 0 | 2.7 | 0 | 0.0 | 0 | 0.0 | **2.9** |
| **Total** | **12** | **7.9** | **28** | **22.0** | **2** | **0.4** | **0** | **0.0** | **30.3** |

Note 1: *In some instances, turbine pads impact more than one prime farmland type. Number of Turbines represent the prime farmland type most impacted per turbine.*
Note 2: *Acres impacted are based on 29 -foot turbine foundation and ring radius.*

As described in the Application, if construction activities are executed outside of winter months, temporary impacts to agriculture fields may occur. These temporary impacts may include limited planting opportunity, crop damage, drain tile damage, and soil compaction. Permanent impacts were calculated by using the Project construction corridor and associated facility workspace disturbance areas based upon: 16 foot wide access road; 29 foot radius turbine site; and 2.9 acres for the Project substation and O&M facility sites. Upon completion of construction, temporarily disturbed areas will either be returned to agricultural use or revegetated in compliance with application requirements and/or landowner requests.

The 2019 Project Layout does not change the description of resources, impacts, or mitigative measures for forestry or mining.

## 8.11 Tourism

The snowmobile trails included in the Application have been updated for the 2019 Project Layout using Freeborn County information (see Figure 5 in Attachment D). The Application included state data for snowmobile trails which had a different route in one of the locations (i.e., the snowmobile trail that crosses the southwest corner of the Project

Area which is approximately 5 miles in length and is near 830th and 840th Avenues). None of the snowmobile trails will be impacted by the 2019 Project Layout. The closest turbine to the snowmobile trails is T-24 at approximately 503 feet (Figures 2 and 5). Other than this, the 2019 Project Layout does not change the description of resources, impacts, or mitigative measures for tourism.

### 8.12 Local Economies

The 2019 Project Layout does not change the description of resources, impacts, or mitigative measures for local economies.

### 8.13 Topography

The 2019 Project Layout does not change the description of resources, impacts, or mitigative measures for topography.

### 8.14 Soils

The types of soils in the 2019 Project Layout are the same since the Project Area has not changed. The impacts and mitigative measures described in the Application apply to the 2019 Project Layout.

### 8.15 Geologic and Groundwater Resources

The surficial geology, bedrock geology and aquifer descriptions of resources, impacts, and mitigative measures described in the Application are consistent with the 2019 Project Layout.

### 8.16 Surface Water and Floodplain Resources

The surface water and floodplain description of resources, impacts, and mitigative measures described in the Application are consistent with the 2019 Project Layout. Because the Project Area has not changed since the Application, there are not changes to the PWI watercourses. Similarly, there are no additional impaired waters in the 2019 Project Layout. Because no wind farm facilities are being shifted into these resources, the impacts and mitigative measures for Public Waters and impaired waters are consistent with the Application. Xcel Energy has applied for a License to Cross Public Waters and a Public Waters Work permit with the Minnesota Department of Natural Resources, to support construction of the project. Both of these permitted activities will also be permitted by the Cedar Watershed District.

## 8.17 Wetlands

Review of current 2019 National Wetland Inventory (NWI) data indicates a slight increase to the acreages included in the Application associated with a new freshwater pond/riverine NWI type that total approximately 2.9 acres in size (see Updated Figure 14 in Attachment D). This new NWI feature will not be impacted by the Project. This increases the total acres of wetland within the Project Area from 404.7 acres in the Application to 407.6 per the 2019 NWI data. The wetland description of resources, impacts, and mitigative measures described in the Application are consistent with the 2019 Project Layout.

Based on NWI-mapped wetlands, the 2019 Project Layout would impact zero acres of wetlands, less than the 0.1 acres of impacted wetlands in the Application. As discussed in the Application, potential impacts to NWI-mapped wetlands have been field verified by wetland delineations. These field surveys will provide more accurate boundaries of the desktop NWI data, and/or confirm absence of mapped wetlands or presence of unmapped wetlands. The 2019 Project Layout has been refined to minimize impacts to wetlands incorporating the delineation data to date. The Company is coordinating with the U.S. Army Corps of Engineers and the Local Government Unit on the wetland delineation methodology and will permit wetland impacts as necessary.

## 8.18 Vegetation

Land cover types have been revised with updated NLCD data that has been issued since the Application (see Updated Table 8.18-1 below). Cultivated crops continue to comprise most of the Project Area.

**Updated Table 8.18-1: National Land Cover Types in the Project Area**

| Land Cover | Area (acres) | Percent of Project Area |
|---|---|---|
| Cultivated Crops | 24,700 | 94.0% |
| Developed, Open Space | 815 | 3.1% |
| Deciduous Forest | 184 | 0.7% |
| Developed, Low Intensity | 166 | 0.6% |
| Emergent Herbaceous Wetlands | 135 | 0.5% |
| Hay/Pasture | 104 | 0.4% |
| Grassland/herbaceous | 75 | 0.4% |
| Developed, Medium Intensity | 25 | 0.1% |
| Woody Wetlands | 27 | 0.1% |
| Open Water | 17 | <0.1% |
| Barren Land | 14 | <0.1% |
| Mixed Forest | 12 | <0.1% |
| Developed, High Intensity | 1 | <0.1% |
| **Total** | **26,273** | **100%**[1] |

[1] Total Project Area is 26,273 acres (same as in Application).

Mapped native prairie and native plant communities have also been updated to reflect current Minnesota Department of Natural Resources (MN DNR) data. The Updated Table 8.18-2 includes a summary of MN DNR native prairie data, field surveyed potential native prairie (not previously plowed), and field surveyed potential native prairie (previously plowed); these last two designations were based upon field survey completed by WEST on behalf of Freeborn Wind. "Potentially Native Prairie (not previously plowed)" means grasslands with no evidence of previously being tilled based on landcover, soil characteristics, and review of Google Earth aerial imagery and totaled 321.8 acres for this update; approximately 17.4 acres less of native prairie in this category was surveyed compared to that included in the Application. "Potentially Native Prairie (previously plowed)" means evidence of trace remnants of planted row crop intermixed with grassland vegetation, a decline in soil structure representative of impacted soils (i.e., historic plowing), review of Google Earth aerial imagery of obvious furrows signatures, or pastures not completely smoothed over with slight furrows and appeared to be left fallow and totaled 129.2 acres for this update; approximately 0.5 acres additional of native prairie in this category was surveyed compare to that included in the Application.

There are approximately 2.4 additional acres of MN DNR mapped native prairie not included in the Application, which is located along the west-central boundary of the Project Area adjacent to Highway 65 and a railroad line, which is designated as MN DNR Railroad ROW Prairie (see Updated Table 8.18-2 below and Updated Figure 10 in Attachment D). These additional 2.4 acres are not impacted by Project facilities.

**Updated Table 8.18-2: Potential Native Prairie in the Project Area**

| Source | Acres | Percent of Project Area |
|---|---|---|
| MN DNR Native Prairie | 2.4 | <0.1% |
| Freeborn Wind – Potentially Native Prairie (not previously plowed) | 321.8 | 1.2% |
| Freeborn Wind – Potentially Native Prairie (previously plowed) | 129.2 | 0.5% |
| **Total Native Prairie** | **453.4** | **1.7%**[1] |

[1] Total Project Area is 26,273 acres (same as in Application).

The Project Area now includes one additional new Site of Biodiversity Significance (SOBS) - below the threshold of significance – and there are no other changes to the Application information. The additional site totals an additional 45 acres of SOBS in the Project Area compared to the Application (Updated Table 8.18-3 and Updated Figure 10 in Attachment D).

**Updated Table 8.18-3: Sites of Biodiversity Significance within the Project Area**

| Site of Biodiversity Significance | Number of Sites in the Project Area | Acres |
|---|---|---|
| Below | 3 | 119 |
| Moderate | 1 | 5.8 |
| High | 0 | 0 |
| Outstanding | 0 | 0 |
| **Total** | **4** | **124.9**[1] |

[1] The total Project Area is 26,273 acres (same as in Application).

The 2019 Project Layout will permanently impact 38.3 acres of land with turbines, access roads, and the Project substation (Updated Table 8.18-4), which includes impacts from Alternative Turbine 23 (see footnote 1 to Updated Table 8.18-4 below.). While the 2019 Project Layout has slightly more permanent impacts overall (38.3 acres compared to 38.2 in the 2017 layout), proportionately, the impacts are similar. Most of the permanent impacts (93 percent) are to cultivated crops.

**Updated Table 8.18-4: Summary of Estimated Permanent Impacts to Vegetation (acres)**

| Facility | Cultivated Crops | Deciduous Forest | Developed | Total |
|---|---|---|---|---|
| Turbines | 0.3 | 0 | 0 | 0.3 |
| Access Roads | 24.8 | 0 | 1 | 25.8 |
| Project Substation + O&M Facility | 10.4 | 0 | 1.8 | 12.2 |
| **Total Project Impacts** | **35.5** | **0** | **2.8** | **38.3** |
| **Total within Project Area** | **24,700** | **184** | **1,007** | |

The 2019 Project Layout avoids permanent impacts to MN DNR-mapped native prairie, native plant communities, and sites of moderate biodiversity significance. Xcel Energy is coordinating with the MN DNR and DOC-EERA on a Native Prairie Protection and Management Plan, which will address avoidance, minimization, and mitigation measures for native prairie, native plant communities, and sites of biodiversity significance. The other mitigative measures described in the Application apply to the 2019 Project Layout.

## 8.19 Wildlife

The characterization of wildlife that may utilize the Project Area is the same as what is described in the Application. Tier 3 studies that were in progress when the Application was submitted have been completed and are incorporated into the draft Avian and Bat Protection Plan (ABPP), which has also been reviewed by the MN DNR. Impacts and mitigative measures described in the Application apply to the 2019 Project Layout and the Company will comply with Site Permit Sections 7.1 and 7.5.

### 8.20 Rare and Unique Resources

The description of resources, impacts, and mitigative measures described in the Application also apply to the 2019 Project Layout. There are no additional MN DNR Natural Heritage Information System (NHIS) records in the Project Area based upon review of MN DNR NHIS licensed data in June 2019.

### 11.1 Decommissioning and Restoration

On February 11, 2019, Freeborn Wind submitted a Compliance Filing containing the Decommissioning Plan in accordance with Section 11.1 of the Site Permit. We include a copy of the Decommissioning Plan as Attachment J to this filing.

## C. SITE PERMIT AMENDMENTS

On August 19, 2019, the Company provided the Commission with a current 2019 Project Layout for the Freeborn Wind Farm. The Company respectfully requests that the Commission amend the December 19, 2018 Site Permit, as amended by the Commission on May 10, 2019 Order Amending Site Permit, as described below.

### SECTION 2.0 - PROJECT DESCRIPTION

The Site Permit currently reads as follows:

> *The Freeborn Wind Farm, when fully constructed and operational will have a nameplate capacity of up to 200 MW, of which, 84 MW will be located in Freeborn County, Minnesota and the remaining 116 MW will be located in Worth County, Iowa. The Project will consist of 42 2-MW wind turbines, consisting solely of one turbine model or a combination of turbine models, which may include Vestas V110 and Vestas V116 as identified in the Permittee's Site Permit Application.*

The Company requests an amendment to this section as follows:

> *The Freeborn Wind Farm will be a 200 MW nameplate capacity LWECS, 82 MW of which will be located in Freeborn County, Minnesota. The LWECS portion in Minnesota will consist of 10 Vestas V110 and 31 Vestas V120 turbines. Both turbine models are 2 MW in size.*

The turbine change is one of the measures taken by the Company to mitigate the economic impacts of the TCJA. The combination of V110 and V120 turbine generators is expected to achieve a greater capacity factor than the 2017 Project layout of V110 and V116 turbine generators. This higher capacity factor will result

in higher annual energy production, which in turn will reduce the levelized cost of energy and mitigate the impacts of the TCJA.

The turbine towers will be conical tubular steel with a hub height of up to 263 feet. The V120 turbines will measure 459 feet from the base of the tower to the tip of the upright blade with a rotor diameter of 394 feet. The portion of the foundation that is above ground is 18 feet wide at the base of the tower. A transformer inside the V110 and V120 turbines will be used to step up the voltage to 34.5 kV.

**SECTION 3.0 - DESIGNATED SITE**

In the last sentence of this section, the Site Permit indicates that wind rights or easements have been obtained by the Permittee and include approximately 17,435 acres of land under easement and with participation agreements.

The Company requests an amendment to the last sentence of this section as follows:

> *Wind rights or easements have been obtained by the Permittee and include approximately 21,313 acres of land under easement and with participation agreements.*

**SECTION 3.1 - TURBINE LAYOUT**

The Site Permit references official site maps attached to the permit. These maps show wind turbine and associated facility layout for Vestas V110 and Vestas V116 turbines. We provide as Attachment A to this request, a map showing the 2019 Project Layout with Vestas V110 and V120 turbines. The Company requests approval to amend the permit with the site map with those provided in Attachment A.

We note that the text within this section of the Site Permit continues to be accurate as written and request no change to the text.

**SECTION 4.1 - WIND ACCESS BUFFER**

The Site Permit states:

> *Wind turbine towers shall not be placed less than five rotor diameters on the prevailing wind directions and three rotor diameters on the non-prevailing wind directions from the perimeter of the property where the Permittee does not hold the wind rights, without the approval of the Commission. This section does not apply to public roads and trails.*

The Company confirms that the updated facility layout complies with this requirement. Updated Figure 2 in Attachment D illustrates the required wind access buffer. The Project Area has not changed and did not need to be changed to address the use of the Vestas V120 turbines as all setbacks are being met within the Project Area. A Project turbine layout comparison is provided in Attachment B and 2019 Project setbacks are indicated in Attachment C.

### SECTION 4.2 - RESIDENCES

The Site Permit states:

> *Wind turbine towers shall not be located closer than 1,000 feet from all residences or the distance required to comply with the noise standards pursuant to Minn. R. 7030.0040, established by the Minnesota Pollution Control Agency, whichever is greater.*

We confirm that the updated facility layout complies with this requirement. Updated Figure 2 in Attachment D illustrates the setbacks from residences and other features that were applied to the facility layout. The closest turbine to a participating residence is Turbine T-23, which is approximately 1,096 feet from the nearest residence. The nearest non-participating residence is located approximately 1,367 feet from Turbine T-29, the nearest turbine. An updated noise assessment for the current layout is included as Attachment E to this amendment request. Please see Section 4.3 below for further details.

### SECTION 4.3 - NOISE

The Site Permit states:

> *The wind turbine towers shall be placed such that the Permittee shall, at all times, comply with the noise standards established by the Minnesota Pollution Control Agency as of the date of this permit and at all appropriate locations. The noise standards are found in Minnesota Rules Chapter 7030. Turbine operation shall be modified or turbines shall be removed from service if necessary to comply with these noise standards. The Permittee or its contractor may install and operate turbines as close as the minimum setback required in this permit, but in all cases shall comply with Minnesota Pollution Control Agency noise standards. The Permittee shall be required to comply with this condition with respect to all homes or other receptors in place as of the time of construction, but not with respect to such receptors built after construction of the towers.*

As evidenced by the updated noise assessment for the Vestas V110/V120 layout provided in Attachment E, and the New Tables 8.3-5 and 8.3-6 above, the total projected sound levels from the Project as currently designed are expected to be below the state nighttime limit of 50 dBA (L50).

### SECTION 4.9 - WIND TURBINE TOWERS

The Site Permit states:

> *Structures for wind turbines shall be self-supporting tubular towers. The towers may be up to 80 meters (262.5 feet) above grade measured at hub height.*

We confirm that no amendment is needed to this section of the Site Permit. The Vestas V110 and V120 turbines are self-supporting turbine towers of conical tubular steel and will have a hub height of up to 80 meters (262.5 feet).

### SECTION 5.2.26 - TOWER IDENTIFICATION

The Site Permit states:

> *All turbine towers shall be marked with a visible identification marker.*

We provide as Attachment B, a figure illustrating the difference between the previously permitted V110/V116 turbine locations and numbering and the current Vestas V110/V120 layout. We additionally provide as Attachment G, a table summarizing the changes in turbine locations. Signage will be present at each turbine location indicating the turbine number and facility ownership.

### SECTION 5.4 - ELECTRICAL COLLECTOR AND FEEDER LINES

The Site Permit states:

> *Collector lines that carry electrical power from each individual transformer associated with a wind turbine to an internal project interconnection point shall be buried underground. Collector lines shall be placed within or adjacent to the land necessary for turbine access roads unless otherwise negotiated with the affected landowner.*
>
> *Feeder lines that carry power from an internal project interconnection point to the project substation or interconnection point on the electrical grid may be overhead or underground. Feeder line locations shall be negotiated with the affected landowner. Any overhead or underground feeder lines that parallel public roads shall be placed within the public rights-of-way or on private land immediately adjacent to public roads. If overhead feeder lines are located within public rights-of-way, the Permittee shall obtain approval from the governmental unit responsible for the affected right-of-way.*
>
> *Collector and feeder line locations shall be located in such a manner as to minimize interference with agricultural operations including, but not limited, to existing drainage patterns, drain tile, future tiling plans, and ditches. Safety shields shall be placed on all guy wires associated with overhead*

*feeder lines. The Permittee shall submit the engineering drawings of all collector and feeder lines in the site plan pursuant to Section 10.3.*

We provide as Attachment A, an amended map of the Project facilities, including collector and feeder lines. The Site Permit provides general specifications for collector and feeder line installation. Similar to many other wind farm construction projects, design of this Project's electrical collection system has evolved, and continues to be refined, with Project development and completion of environmental studies. Per the updates to Section 8 of the Application above, impacts to human health and the environment are being minimized to the extent practicable and will be similar to or less than impacts anticipated from the original permitted designs. Projected impacts are primarily temporary and are related to wetlands, native prairie, agriculture, soils, and other resources addressed in the Application. The Company will submit the engineering drawings of all collector and feeder lines in the site plan pursuant to Section 10.3 of the Site Permit.

**SECTION 7.2 - SHADOW FLICKER**

Among other things, the Site Permit requires:

*At least 14 days prior to the pre-construction meeting, the Permittee shall provide data on shadow flicker for each residence of non-participating landowners and participating landowners within and outside the project boundary potentially subject to turbine shadow flicker exposure.*

We provide as Attachment F, an updated Shadow Flicker modeling report reflecting the 2019 Project Layout. Modeling results show the realistic estimated highest shadow flicker for a non-participant is 41:57 hours per year; and the realistic estimated highest shadow flicker for a participant is 42:31 hours per year. However, it should be noted that the study used conservative assumptions (*e.g.*, no blocking from trees or buildings) and the actual number of hours of shadow flicker that would be observed likely will be less than those predicted by this study. Additionally, consistent with Site Permit Section 7.2, the Company will develop a Shadow Flicker Management Plan detailing how turbine operations will be adjusted to mitigate shadow flicker exposure exceeding 30 hours per year at any one receptor.

**SECTION 7.5.1 - AVIAN AND BAT PROTECTION PLAN**

Among other things, the Site Permit requires compliance with the provisions of the Avian and Bat Protection Plan (ABPP), as submitted in Giampoli Rebuttal Schedule 1, filed on January 22, 2018, and revisions resulting from the annual audit of ABPP implementation.

The Company will comply with all of the requirements of this Section 7.5.1 concerning the ABPP in relation to the 2019 Project Layout. The Company will provide an amended

turbine layout map in the revised ABPP that will be filed 14 days prior to the pre-construction meeting. The revised ABPP will include a discussion of potential impacts to birds and bats and will also include additional wildlife studies that have been completed since the Application was filed. The Company will be coordinating with the DNR and DOC-EERA in mid- to late-2019 to finalize the updated ABPP, as well as the updated Native Prairie Protection Plan (NPPP), which will be filed 30 days prior to the site plan filing per Section 4.7 of the Site Permit.

### SECTION 10.3 - SITE PLAN

At least 14 days prior to the pre-construction meeting, the Company will submit a full Project site plan and engineering drawings to the Commission, EERA and the Freeborn County Environmental Services Office. We provide as Attachment A, a figure that provides the current layout which includes all the facilities. Attachment B is a figure that provides a comparison between the previously permitted Vestas V110/V116 layout and the current Vestas V110/V120 layout. The changes between the previously permitted and updated layouts are due to a variety of factors, including advanced engineering since the site permit was granted, geotechnical data relative to individual turbine sites, landowner input, and environmental information gathered in the field that influenced micro-siting of turbines, and any setbacks required as a result of these turbine shifts. The 2019 Project Layout helps minimize the impacts to human health and the environment, which are similar to, or less than, the anticipated impact from the originally permitted layouts. Attachment G is a table summarizing the changes to the turbine locations and provides additional details regarding the changes, such as turbine moves to avoid wetland impacts.

## CONCLUSION

For the reasons stated above, the Company respectfully requests the Commission approve our Request for Amendment in the Freeborn Wind Farm LWECS wind project Site Permit. The Company agrees to abide by all the terms and conditions of the currently approved Site Permit, as modified by the above-requested amendments.

We have electronically filed this document with the Minnesota Public Utilities Commission, and copies have been served on the parties on the attached service list. Please contact Bria Shea at bria.e.shea@xcelenergy.com or (612) 330-6064 or Jennifer Roesler at jennifer.roesler@xcelenergy.com or (612) 330-1925 if you have any questions regarding this filing.

Sincerely,

/s/

BRIA E. SHEA
DIRECTOR, REGULATORY AND STRATEGIC ANALYSIS

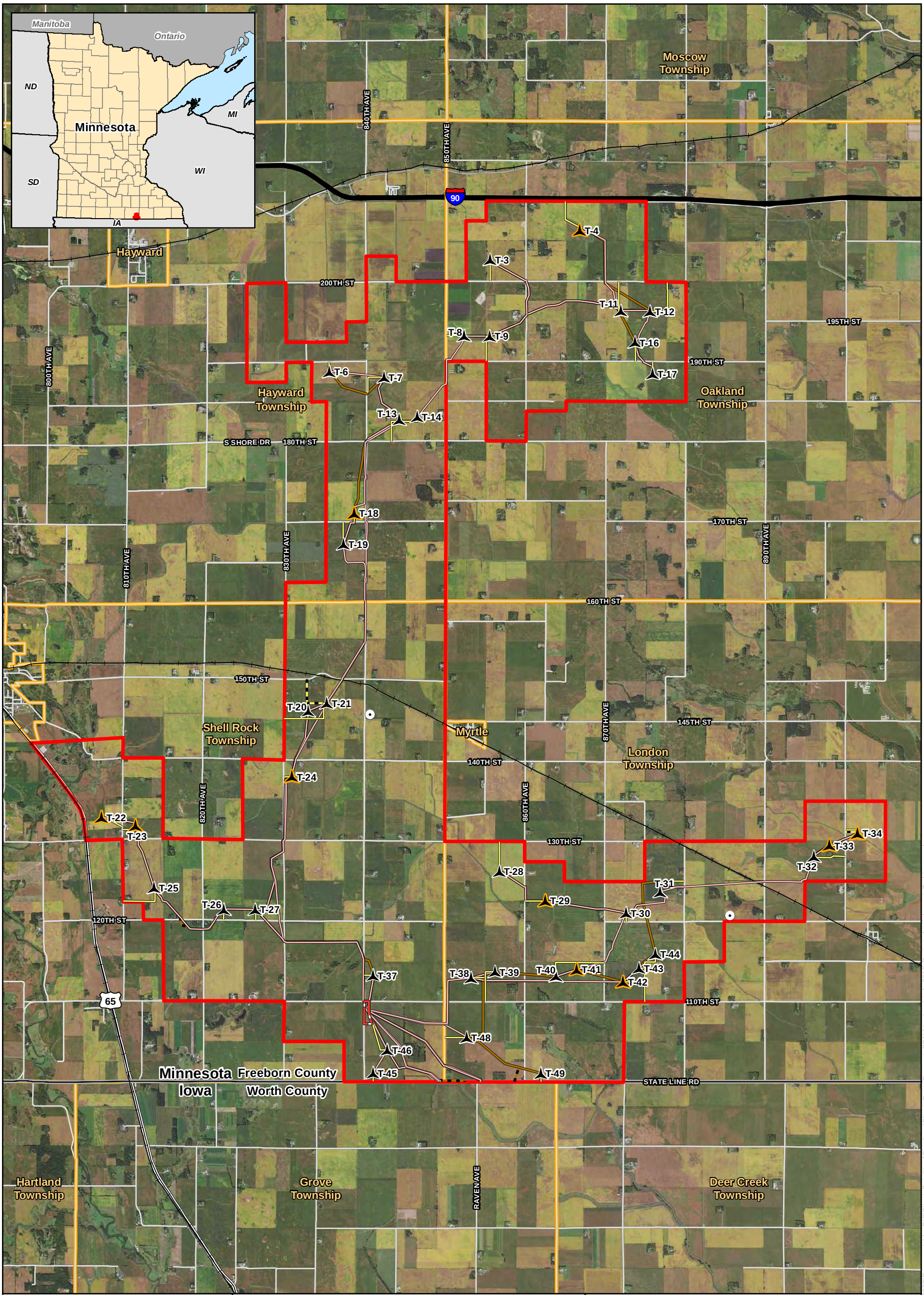
c: Service List
Enclosures

**ATTACHMENTS**

| | |
|---|---|
| Attachment A | 2019 Project Layout |
| Attachment B | Turbine Layout Comparison |
| Attachment C | 2019 Project Setbacks |
| Attachment D | 2019 Updated Project SPA Figures |
| Attachment E | 2019 Updated Pre-Construction Noise Analysis |
| Attachment F | 2019 Updated Shadow Flicker Study |
| Attachment G | Summary Table of Changes to Turbine Locations |
| Attachment H | SHPO Concurrence Letter dated December 31, 2018 |
| Attachment I | SHPO Concurrence Letter dated June 21, 2019 |
| Attachment J | Decommissioning Plan |

# Attachment A

# 2019 Project Layout




FREEBORN WIND FARM

0 0.5 1 Miles

1 inch = 1 miles

*Imagery Source: 2017 Color FSA*
*Data Source: Invenergy, MN DNR, MN DOT, NPMS, Census*

For Environmental Review Purposes Only

**Attachment A**
**2019 Project Area, Layout and Turbines**

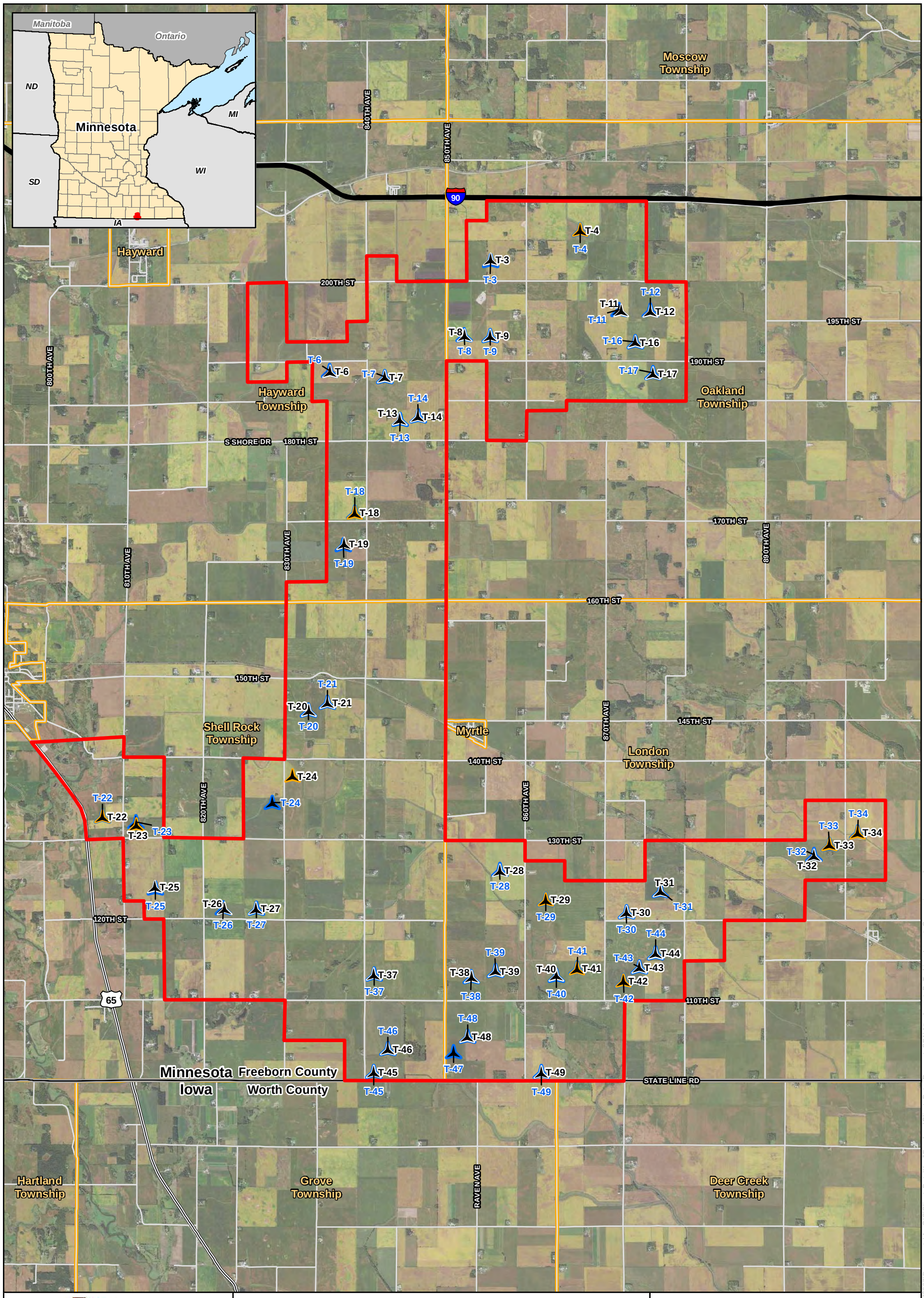
**Freeborn Wind Farm**
**Freeborn County, MN**
**August 2019**

- Vestas V110
- Vestas V120
- Permanent Met Tower
- Project Boundary
- O&M and Project Substation
- Access Road
- Alternate Access Road
- Collection Line
- Crane Path
- Alternate Crane Path

**Date:** (8/19/2019) **Source:** C:\Users\MueKJ0907\Documents\ArcGIS\Client_Data\Xcel\Freeborn\Client_Data_Request_SPA\Attachment_A_2019_Project_Area_Layout_Turbines.mxd

# Attachment B

# Turbine Layout Comparison




FREEBORN WIND FARM

0 0.5 1 Miles

1 inch = 1 miles

*Imagery Source: 2017 Color FSA*
*Data Source: Invenergy, MN DNR, MN DOT, NPMS, Census*

For Environmental Review Purposes Only

**Attachment B**
**Turbine Layout Comparison**

**Freeborn Wind Farm**
**Freeborn County, MN**
**August 2019**

2017 Permitted Turbine Layout

**2019 Site Permit Amendment Layout**

Vestas V110

Vestas V120

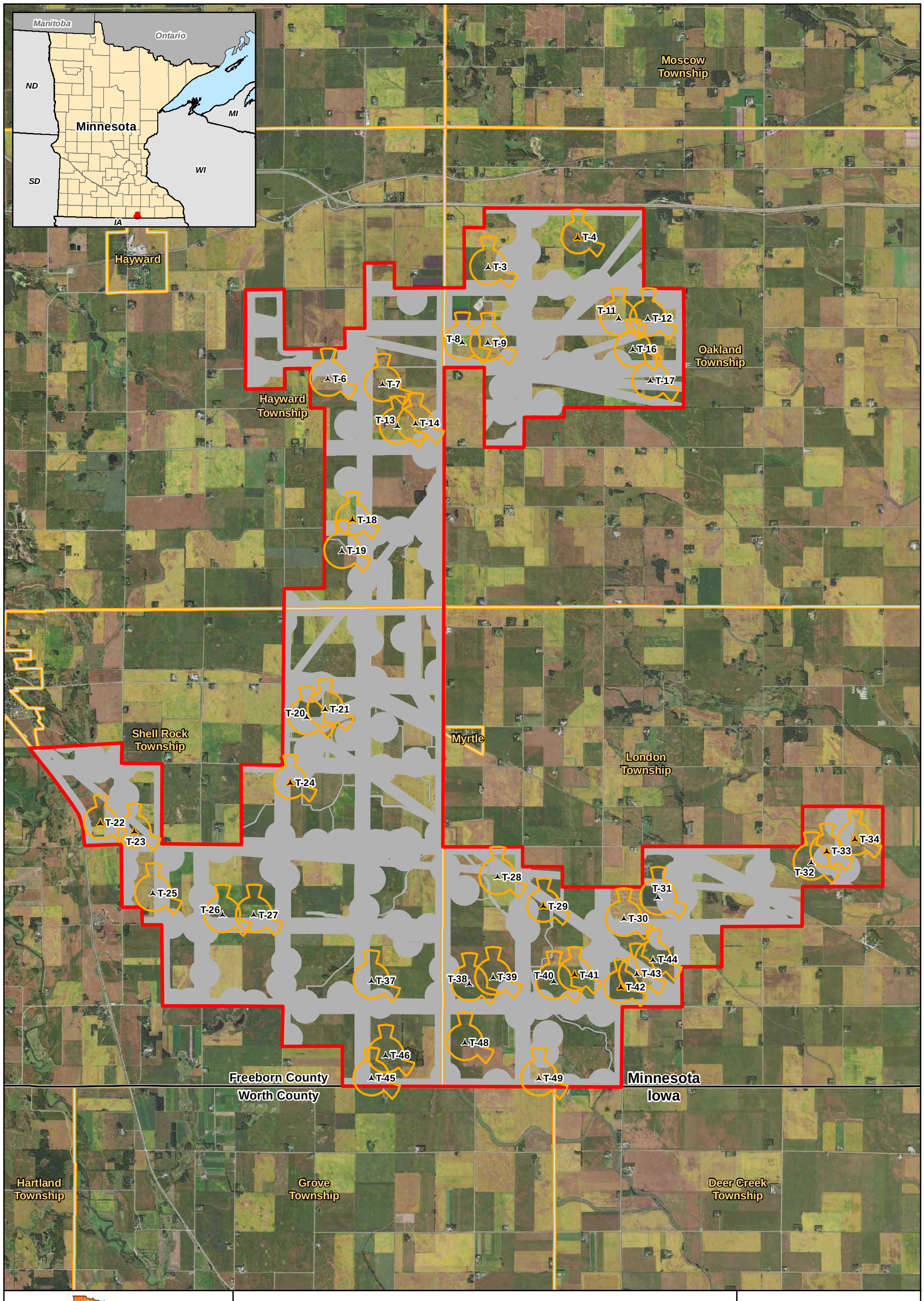
Project Boundary

**Source:** C:\Users\MueK\0907\Documents\ArcGIS\Client_Data\Xcel\Freeborn\Client_Data_Request_SPA\Attachment_B_Turbine_Layout_Comparison.mxd

**Date:** (8/19/2019)

# Attachment C

# 2019 Project Setbacks




FREEBORN WIND FARM

0 0.5 1 Miles

1 inch = 1 miles

*Imagery Source: 2017 Color FSA*
*Data Source: Invenergy, MN DNR, MN DOT, Census, NPMS, Comseach*

For Environmental Review Purposes Only

**Attachment C**
**2019 Project Setbacks**

**Freeborn Wind Farm**
**Freeborn County, MN**
**August 2019**

- Vestas V110
- Vestas V120
- Project Boundary
- 3x5 Wind Access Buffer
- Setbacks

Source: C:\Users\MueKJ0907\Documents\ArcGIS\Client_Data\Xcel\Freeborn\Client_Data_Request_SPA\Attachment_C_2019_Project_Setbacks.mxd
Document Path: Date: (8/19/2019)